18. (New) An apparatus for performing a silylation treatment on a surface of a resist film disposed on a substrate, comprising:

a process chamber;

a hot plate disposed in the process chamber and configured to heat the substrate from a side reverse to a side on which the resist film is disposed;

a supply system configured to supply a vapor containing a silylation reagent into the process chamber;

an exhaust system configured to exhaust the process chamber;

a substrate holder configured to move the substrate up and down relative to the hot plate in the process chamber; and

a driving and controlling section configured to drive and control the substrate holder, and cause the substrate holder to keep the substrate at three or more height positions relative to the hot plate, the three or more height positions including at least an upper position where the substrate is loaded/unloaded to/from the substrate holder, a middle position where the substrate is maintained at rest to be pre-heated by heat from the hot plate at a first temperature below a temperature at which silylation of the surface of the resist film effectively occurs, and a lower position where the substrate is maintained at rest to be heated by heat from the hot plate at a second temperature higher than the first temperature, said second temperature being high enough to cause effective silylation of the surface of the resist film to proceed.

19. (New) The apparatus according to claim 18, wherein the substrate holder comprises lifter pins penetrating through holes formed in the hot plate, and the lifter pins are configured to support the substrate on top ends thereof.

20. (New) The apparatus according to claim 19, further comprising an inactive gas supply section configured to supply an inactive gas between the hot plate and the substrate through the holes formed in the hot plate through which the lifter pins penetrate.

21. (New) The apparatus according to claim 18, wherein the substrate is in contact with the hot plate at the lower position.

22. (New) The apparatus according to claim 18, wherein the supply system is configured to supply the vapor horizontally.

23. (New) The apparatus according to claim 22, wherein the supply system comprises a supply ring disposed to surround the substrate, and supply holes for supplying the vapor are formed in an inner surface of the supply ring.

24. (New) The apparatus according to claim 23, wherein the supply holes comprise holes arrayed in an angular direction over the inner surface of the supply ring.

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25. (New) The apparatus according to claim 24, wherein the exhaust system comprises an exhaust port formed at a center of a ceiling of the process chamber.

26. (New) The apparatus according to claim 23, wherein the supply holes comprise an upper hole and a lower hole arrayed in a vertical direction, and the upper hole has a diameter larger than that of the lower hole.

27. (New) The apparatus according to claim 23, wherein the supply holes are formed in half of the inner surface of the supply ring in an angular direction, and the exhaust system comprises exhaust holes formed in the remaining half of the inner surface of the supply ring to face the supply holes.

28. (New) An apparatus for performing a silylation treatment on a surface of a resist film disposed on a substrate, comprising:

a process chamber;

a hot plate disposed in the process chamber and configured to heat the substrate from a side reverse to a side on which the resist film is disposed;

a supply system configured to supply a vapor containing a silylation reagent into the process chamber;

an exhaust system configured to exhaust the process chamber;

a substrate holder configured to move the substrate up and down relative to the hot plate in the process chamber; and

a driving and controlling section configured to drive and control the substrate holder, wherein the driving and controlling section comprises,

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means for causing the substrate holder to maintain the substrate at an upper position having a first distance between the substrate and the hot plate, the substrate being loaded/unloaded to/from the substrate holder at the upper position,

means for causing the substrate holder maintain the substrate at a middle position having a second distance smaller than the first distance between the substrate and the hot plate, the substrate being heated by heat from the hot plate at a first temperature below the temperature at which silylation of the surface of the resist film can effectively proceed while stationary at the middle position, and

means for causing the substrate holder to keep the substrate at a lower position having a third distance smaller than the second distance between the substrate and the hot plate, the substrate being heated by heat from the hot plate at a second temperature at least as high as the temperature at which silylation of the surface of the resist film can effectively proceed while stationary at the lower position.

29. (New) The apparatus according to claim 28, wherein the substrate holder comprises lifter pins penetrating through holes formed in the hot plate, and the lifter pins are configured to support the substrate on top ends thereof.

30. (New) The apparatus according to claim 29, further comprising an inactive gas supply section configured to supply an inactive gas between the hot plate and the substrate through the holes formed in the hot plate through which the lifter pins penetrate.

31. (New) The apparatus according to claim 28, wherein the substrate is in contact with the hot plate at the lower position.

32. (New) The apparatus according to claim 28, wherein the supply system is configured to supply the vapor horizontally.

33. (New) The apparatus according to claim 32, wherein the supply system comprises a supply ring disposed to surround the substrate, and supply holes for supplying the vapor are formed in an inner surface of the supply ring.

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34. (New) The apparatus according to claim 33, wherein the supply holes comprise holes arrayed in an angular direction over the inner surface of the supply ring.

35. (New) The apparatus according to claim 34, wherein the exhaust system comprises an exhaust port formed at a center of a ceiling of the process chamber.

36. (New) The apparatus according to claim 33, wherein the supply holes comprise an upper hole and a lower hole arrayed in a vertical direction, and the upper hole has a diameter larger than that of the lower hole.

37. (New) The apparatus according to claim 33, wherein the supply holes are formed in half of the inner surface of the supply ring in an angular direction, and the exhaust system comprises exhaust holes formed in the remaining half of the inner surface of the supply ring to face the supply holes.